

Add One Row to Tree (View)

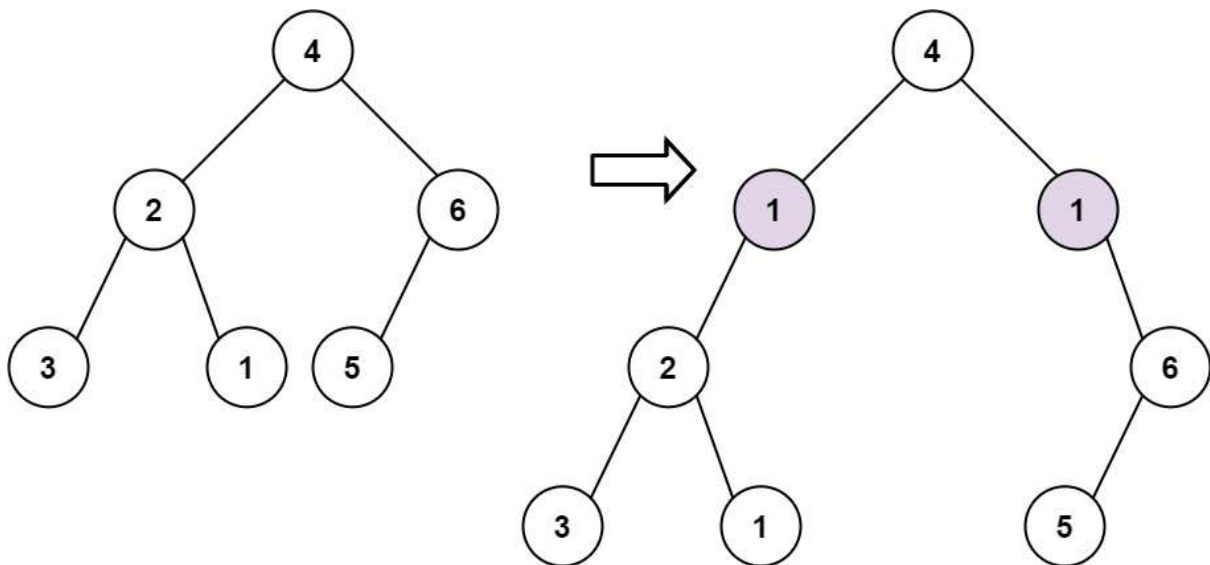
Given the `root` of a binary tree and two integers `val` and `depth`, add a row of nodes with value `val` at the given depth `depth`.

Note that the `root` node is at depth 1.

The adding rule is:

- Given the integer `depth`, for each not null tree node `cur` at the depth `depth - 1`, create two tree nodes with value `val` as `cur`'s left subtree root and right subtree root.
- `cur`'s original left subtree should be the left subtree of the new left subtree root.
- `cur`'s original right subtree should be the right subtree of the new right subtree root.
- If `depth == 1` that means there is no depth `depth - 1` at all, then create a tree node with value `val` as the new root of the whole original tree, and the original tree is the new root's left subtree.

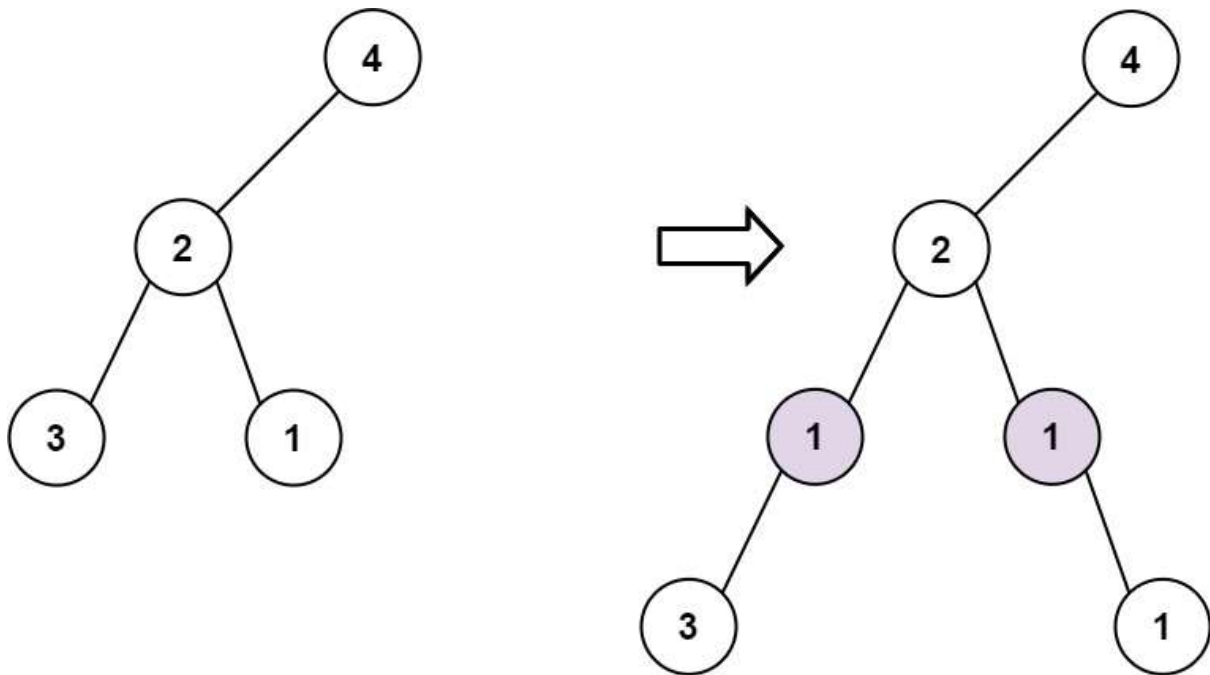
Example 1:



Input: `root = [4,2,6,3,1,5]`, `val = 1`, `depth = 2`

Output: `[4,1,1,2,null,null,6,3,1,5]`

Example 2:



Input: root = [4,2,null,3,1], val = 1, depth = 3

Output: [4,2,null,1,1,3,null,null,1]

Constraints:

- The number of nodes in the tree is in the range $[1, 10^4]$.
- The depth of the tree is in the range $[1, 10^4]$.
- $-100 \leq \text{Node.val} \leq 100$
- $-10^5 \leq \text{val} \leq 10^5$
- $1 \leq \text{depth} \leq \text{the depth of tree} + 1$